SIEMENS

RAS

RX

Servicesoftware

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The following chapter is intended to give an insight into the main functions of the overall program and to assist the initial user in operating the program.

In addition to these content-oriented items the necessary needs (hardware and software) for the service technician and the initial installation procedure for the program are explained.

Program application

The service program assists the service technician in tests or fault location on RAS systems. The coupling between the service PC and the RAS network is effected via a separate RAS controller (RAS-S). The PC is connected via serial interface with the controller, handling communication in the RAS network.

The PC offers to the user a comfortable interactive program menu and help function, enabling the service technician to ascertain all relevant data on the RAS system.

The program has a password protection identifying the user as a member of a user group with different operating rights and possibilities.

A report is prepared and stored for each session.

Software program

The following components are required for using the software program:

NOTE	**Except for the standard set of installation tools, all tools and measurement devices described in the enclosed instructions are listed and specified in part 3 of the ARTD.**

Connecting cable	96 60 978 RE999
Adapter	99 00 218 RE999

Documentation required:

Software disk 3 1/2"	R99-051.114.01.01.02

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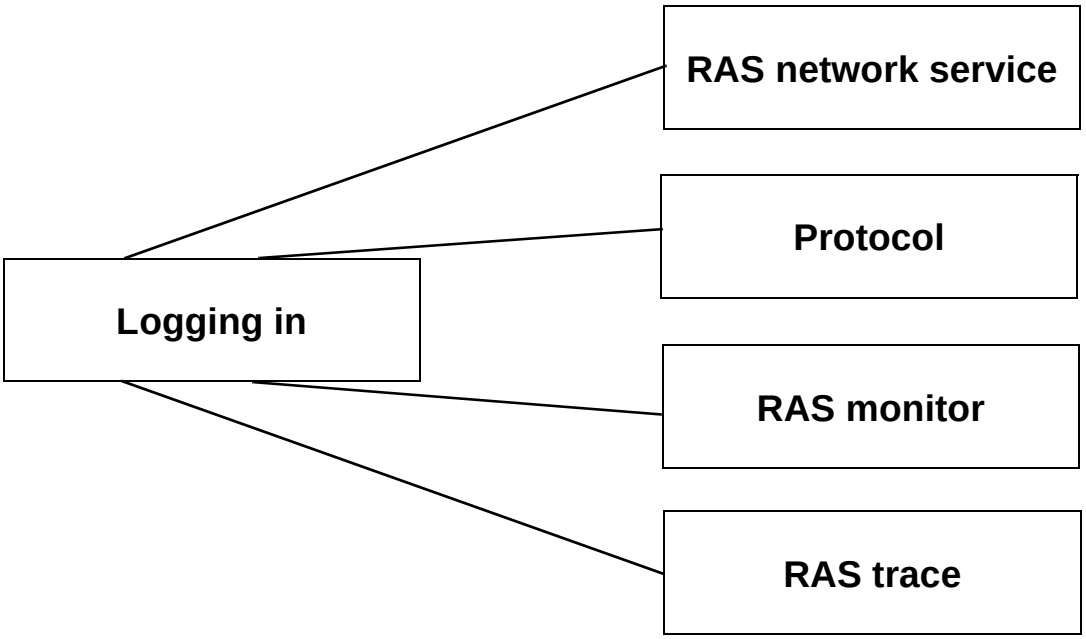
Functions

The following global functions are available:



- **RAS network service**
  Stepwise set-up of communication with accompanying messages and visualization of the network configuration and individual patient data.
- **Protocol**
  All displayed data can be printed out. The print-out is provided with the date and time and serves as a protocol of the service activity. In addition, a protocol file is kept.
- **RAS monitor**
  Dynamic display of the relevant parameters for a definite x-ray process (e.g. selection of radiographic system) in a separate window. Selection of a process is effected via menu tree.
- **RAS trace**
  Recording and visualizing the telegram traffic of the RAS network.

Hardware requirements

Computer system

An IBM-compatible PC is provided as destination for the RAS service program. The specifications for the service PC are described under ARTD 3.1.0.:

Operating system:	MS DOS V3.0 or larger
CPU:	80286 without coprocessor (80287)
Memory configuration:	at least 640 kB
Mass storage	Hard-disk drive, 20 MB or more Floppy disk drive 3.5", 720 kB
Interfaces:	RS 232 C, 300 - 19200 Bauds Centronics parallel
Monitor:	Monochrome or color

Printer

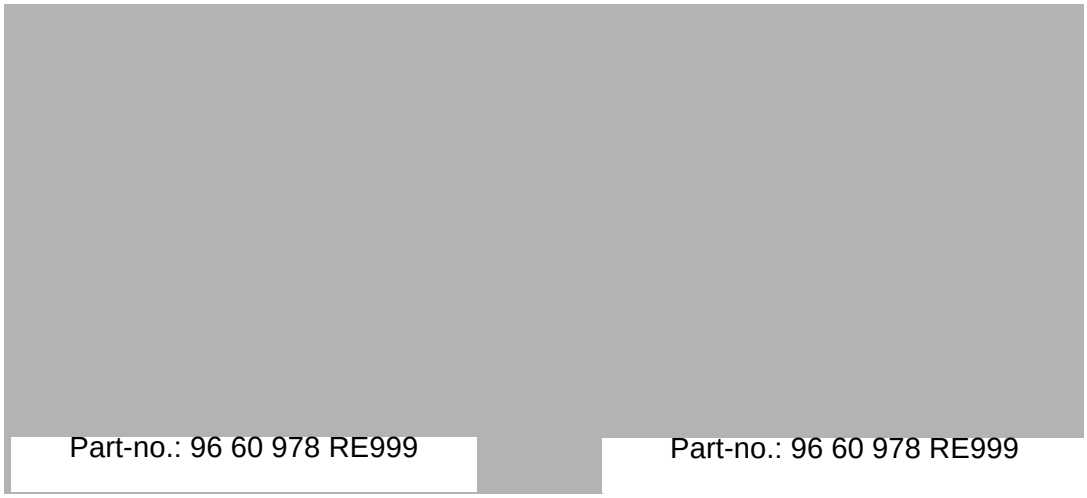
For documentation purposes, the following printers are supported with the EPSON (IBM) character set at the Centronics interface:

- Laser printer with HP Laserjet II emulation
- 9 or 24 wire printers with EPSON emulation

Serial cable

The RS 232 C interface must be connected with the interface on the RAS 10S board in the I.I./TV adapter N93.

The RS 232 C interface is allocated as follows :



Part-no.: 96 60 978 RE999

Part-no.: 96 60 978 RE999

Operation

The service program is described from the view point of the service technician. The individual functions are explained hierarchically according to the program sequence and their menu configuration; all functionalities such as function keys etc. are no longer listed when dealing with details.

Program installation

The following files belong to the RAS service software:

RASSERV.EXE	Executable program
RASSERV.HLP	Helptext file
RASSERV.LOG	Logbook
RASSERV.MSG	Message file
RASSERV.INF	File with info texts for the RAS monitor
RASSERV.FCT	Decoding file for trace telegrams
RASSERV.CFG	File for optional settings
RASSERV.ERR	Error trace decoding file
BEISPIEL.RAS	System example file

The program can be started directly from the program Floppy disk or from the hard disk of the PC. All files must be contained in the same directory (e.g. <RAS>) as the executable program.

The program can be copied from the floppy disk onto the hard disk in the following manner:

If the computer at MS DOS level signals the input request "C:\", a new subdirectory, e.g. RAS, can be set up by entering:

MD C:\RAS↵

To get into the new subdirectory, enter:

CD\RAS↵

The program is copied by entering:

XCOPY A:/S↵

Check whether all data have been copied by entering:

DIR↵

Subsequently, the program can be started from the fixed disk.

We recommend to use a separate program floppy disk on each system and to leave it there.

General operation

Operating concept

The service program makes available to the user a number of different functions. The availability of the function presupposes that the user has identified himself.

The program functions are combined in logical groups. These can be selected via a hierarchical menu. If a function calls for text inputs, the user is requested to make a corresponding entry.

If any errors occur in operation or during the functional sequence, they are signalled to the user. Depending on the gravity of the fault, the program may continue or is stopped.

Hierarchical menu

Each menu item in a Pop-Up-Menu can be moved to by cursor UP-DOWN and selected by CR.

Selection of a menu concept is either followed by execution of a function with possibly requested value inputs or by branching into a lower menu level.

After terminating work in a menu level, you can move back to the next higher level by ESCAPE.

Text entries

The program displays an input field that corresponds to the maximum length of the text to be entered inversely on the screen. The user can enter the necessary text and terminate the entry with CR, abort with ESCAPE or delete individual characters with BACKSPACE. The current input position is marked by flashing cursor.

Illegal keys are answered by the program with a hooting signal. The hooter is also sounded if more characters than allowed are entered or if characters are deleted beyond the start of entry.

Password protection and user groups

To protect the service program against unauthorized use, a password is interrogated at program start. The user will get "into" the actual service program only after correct entry of the password.

Via the password mechanism, the service program permits to the various user groups access to its functions.

As each group has different interests and rights, operating functions are limited according to the specific groups.

If a user group has no access authorization, the corresponding function in the menu is not offered for selection.

The passwords are notified to the service managers and **should be treated confidentially** to prevent unauthorized access.

The specific passwords cannot be changed.

Error messages and responses

The following error classes are distinguished by the service program:

- **Fatal errors** Errors preventing correct continuation of the program. Therefore, the programhas to be aborted.

Example: Memory overflow, floppy disk access error

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- **User errors** Errors preventing continued operation for the present, but which can be eliminated by repeat execution of the function.

Example: Temporary disturbance of data transfer to the unit, impermissible entries.

- **Warnings** Errors which may lead to falsified results of a functional sequence, but need not signify an error function.

Example: Overflow of the longtime fault storage of the unit.

All error messages are output in the provided-for message line. Before further operation is allowed by the service program, the user must acknowledge a current error message by pushing a button. Subsequently, the message is cleared from the screen.

Screen layout

The service program subdivides the monitor into fixed areas. Each area has a definite meaning and is always used by the program in this sense.

Colors

Generally, the screen is operated in black/white mode since a reasonable image quality can be achieved only in this manner when using LCD or plasma displays.

Pop-Up-Menus

The hierarchical operating system appears in the form of Pop-Up-Menus. The following features are characteristic of this form of menu:

- Display of menu items in a box one below the other.
- The box is limited by simple vertical/horizontal lines.
- A maximum of 14 menu items are displayed simultaneously per box.

Window

If more lines than can be indicated are required in a window, the display can be scrolled up/down. The scrolling direction is indicated by a mark in the right-hand upper (U) or right-hand lower corner (D) of the box. For longer texts PAGE UP/DOWN for paging is also allowed beside the keys CURSOR UP/DOWN. The keys for branching to the start and end are displayed, - as far as permissible - in the upper (HOME) or lower window frame (END).

Input fields

The input fields required for processing discrete text inputs are displayed in separate windows. The windows appear in the centre of the screen; any masked menu boxes are restored by the service program subsequent to entering a correct text. A cursor is positioned at the current input position.

Help texts

The help texts which can be activated by F1 are displayed in a separate window. This appears in the centre of the screen; any masked menu boxes are restored by the service program after deselecting the help function by ESCAPE.

Messages

Error messages or pointers are output by the service program in a special line. The messages are retained until they are acknowledged by ESCAPE.

Status display

The status of the communication with the unit (ONLINE/OFFLINE) is output by the service program at the right-hand upper image margin.

Function keys

The function keys F1 - F10 are used for special program functions. A separate line indicates which function can be currently triggered by a specific function key.

Program start

The service program is started by selecting

RASSERV↵

Subsequent to call-in, the following image appears on the monitor.

Explanation:

The program start mask is displayed after activation of the service program. It identifies the service program and requests the operator to enter his name and a password.

Subsequently, the name of a network configuration to be used for comparing nominal and actual values is interrogated.

Up to 20 network configurations can be listed in the bottom part of the window.

By means of the cursor keys, the user can select one of the available configurations and load it with the RETURN key. To create a new unit, he uses the ESCAPE key to get into the entry field via the presented configurations and can enter a name of his choice.

Inputs:

- **User name**, max. 20 characters, min. 1 character long string. Optional text; serves only for documentation. The first character must not be a blank.
- **Password**; characters entered are only output as "*" on the screen. An unknown password is rejected max. 3 times. Subsequently, program execution is aborted automatically.
- **Unit**, max. 8 characters, min. 1 character long name of RAS system. Beneath the name is hidden a file that contains the RAS network configuration for setting up the communication. If no configuration file for the system is available, the program generates a file with the indicated name and stores there the configuration during service. The existence or nonexistence of a file is signalled to the service technician by a corresponding message.
- **Function keys**
  F1 - help texts for the entry of user name, password and unit.

Program start with control options

Alternatively to the before mentioned call, the service program can also be actuated in the form of

RASSERV [/s] [/c]

Interface simulation (/s)

In case that no unit is available, the service program can be started with the option /s. The simulation mode is displayed on the screen. The user can operate the program as if a unit were connected. However, the data read "from the unit" is only simulated.

Color screen outputs (/c)

According to definition, the service program adjusts itself to black/white screens. Using the option /c, it optionally displays the user surface on color screens in multicoloured presentation.

Terminate program

After completing the service, the technician operates the function key F10 to terminate the program. An inquiry is displayed whether a protocol of the current session is to be printed before leaving the program. The protocol is a partial extract of the log file from program start onward. Then, the program is terminated (an example is illustrated in the printer output chapter).

Main menu

The main menu presents the user the individual program to choose from, as well as global settings concerning all parts. You will find a more detailed description of the subareas in the individual chapters.

This part of the service program assists the service technician in tests and troubleshooting on the RAS network configuration.

The following global functions are available:

- Stepwise communication set-up with accompanying messages
- Visualization and interactive analysis of network configuration
- Visualiaztion and analysis of software versions, configuration data, logic and physical addresses (survey)
- Visualiaztion of data for an individual station

All data displayed can be stored and printed out.

RAS network service menu

The RAS network service part is started via the menu item

RAS-Net-Service

in the main menu.

After completed selection, the following image is displayed on the monitor:

- **Overview**
  Visualization of the network topology and display of the configuration data

- **Single station**
  Selection of a single station and display of all station configuration data

- **Set-up**
  Determination of the network topology and the configuration data of a system by Stepwise set-up of the communication.
  Note: The displayed clock does not run during communication!

- **Service**
  Connection build-up and interrogation of all network variables, as well as comparison with the values in the loaded configuration.
  Note: The displayed clock does not run during communication!

- **Load unit**
  Loading a new configuration.

Overview (network visualization)

The service program displays in the menu overview all stored data that it retains in the configuration file. Communication with the RAS ring is not required if the ring confiugration was stored by a preceding service session. Thus, the service technician can obtain a picture of the system at any time.

The RAS network is represented graphically for the user on the screen. Using the menu, the technician can represent individual values of the RAS controller in an overview. However, it should be noted that in an existing configuration file some of the displayed values are derived from the last service session or the last reconfiguration (set-up: see the following chapter) and therefore cannot be actual any longer.

The following values can be selected:

- **Type of station**
  The type of each station in the RAS network (see preceding picture) is displayed. Only the corresponding value is output (0-3). The meaning of the number can be retrieved by the technician either via the help function or can be gathered from the configuration overview of the station concerned (see individual station evaluation).

- **RAS software version**
  The number is displayed subdivided into its components. These are the main version, subversion, state of development and variant code. The last two items are only indicated for values unequal to zero.

- **Controller firmware version**
  This code is burnt in in the controllers. Normally it consists of four ASCII characters. If a nondisplayable character is detected, it is represented as a ?

- **Controller variant**
  The 16-bit numerical value is output decomposed into single values. Bits 15-13 are spare bits, bits 12-8 contain the modification status, bits 7-4 the layout level and bits 2-0 the coding of the assembly.

- **Switches**
  °/. = off/on,!/¡ = 1+2/2+3 connected.
  Visualiaztion of all station-specific settings of HW switches and jumpers.

- **Physical address**
  The physical address indicates the clear identification of each RAS-controller in the network. The output (hexadecimal) number is divided into loop assignment and address set.

- **Logical address (es)**
  Each logical address consists of a component code, an assignment and 16 bits controlling the group membership. At the same time, the code serves for station name allocation. If there are several logical addresses for one station, **** is output. Then, all addresses can be viewed in more detail in the single station menu.

Set-up (reconfiguration)

Reconfiguration takes place fully automatically, i.e. the service program itself determines which stations are available in the network, how the different configurations are set and whether all stations are functional. First of all, communication is set up in the network gradually (for further details, see service). Subsequently, a detailed analysis is performed. After acquisition of all data, these are entered in the configuration file whose name was indicated in the program start mask.

Reconfiguration of a system will store all data ascertained. To avoid overwriting an existing configuration, a checking inquiry is asked and another name used, if necessary. Beside the number of loops and stations, the values touched in the network visualization chapter are transferred into the file. Consequently, an overview of the system is possible at any time with the stored configuration data, without this system being available or without any connection to the system for the time being.

Service (network check)

For checking the system, the service program offers a comparison of all nominal and actual values for each single station in the network and corresponding messages, as soon as differences are recognized. By means of the help texts, the technician is then able to recognize errors and to eliminate them.

If, for example, the number of stations does not correspond with the number of the stored configuration, a corresponding message is output and the difference is also recorded in the log file.

Load unit (loading a configuration)

This menu item enables the technician at any time to alternate different configurations without restarting the service program.

The name of the configuration is interrogated and the configuration is loaded, as far as available. A corresponding message is output and an entry written into the log file.

All existing configurations are output simultaneously in the input window to give the user an overview so that he need not retain the notation of the individual names.

Single station (single station evaluation)

In addition to network visualization, it is also possible to have a close look at a single station. For this purpose, the technician is offered a selection of existing stations on selecting the "single station" menu item. Since it is possible that there are several stations having the same identification in the network, the currently selected station is highlighted.

On selecting the desired station, the technician is presented a new menu with station-specific service functions:

- **Configuration**
  A survey is given of the configuration of the selected station.

The configuration of a station may have the following appearance, for example:

To allow a fast change between the individual configurations, circulating interrogation of each single configuration is possible, by operating the keys Page UP/Down.

Printer outputs

With various menu items, the print function (F2) output takes place when depressing the F2 key depending on the actual trigger point, i.e. when viewing the configuration of a station, the technician also receives the corresponding data printout; when he reads out the trace buffer, its contents are written down.

All outputs can also be turned around into a file. To do so, the program enquires prior to printing if and in which file printing is requested. If the file does already exist, the single printouts are lined up in a row.

Example of a printer output during network visualization

Example of a printer output for the single-station evaluation configuration.

Example of an output of the entire protocol for the current session on printer.

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This part of the service program serves for checking x-ray-specific processes. The RAS functions which are relevant for the process are preset by slecting a process in the system monitor menu. For representation of the contents, only definite parameters of a telegram are used yet again.

As a source of gaining information, on the one hand, communication in the RAS network (online monitor) and on the other hand, trace recording or a stored online monitor session can be used (offline monitor).

On selection of the system monitor, a window appears with the request to enter a file name (trace file). At the same time, up to 20 existing files belonging to the unit can be displayed. After completion of name entry, a requential menu appears with the two monitor modes "**online monitor**" and "**offline monitor**" and a menu item "**load**" for subsequent loading of a trace file.

Online monitor

In this operating mode, the incoming RAS network communication is evaluated and displayed in real time. At the same time, the incoming telegrams are written into the initially indicated file. After closing the online monitor session, there exists a file which can also be analyzed subsequently in the offline monitor.

In contrast to recording in trace mode, only the functions given by the process are stored in a file generated via the online monitor. All other functions get lost by selection.

Offline monitor

Here, a trace recording or aa recorded online monitor session can be loaded and analyzed subsequently. The service program reads the indicated file and filters out the RAS functions given by the process, and displays the parameters.

Process selection menu

As soon as the system monitor mode is selected, the main menu is displayed with the process selection on the screen.

In the online mode, selection of a menu item entails reinitialization of the RAS network by the SPC.

During initialization, the coupling state is displayed in a separate window and this is deleted again, if successful.

Failure of coupling is signalled by coressponding messages.
In the offline mode, the indicated file is opened after selecting the process and the RAS functions requested through the process are searched and displayed.

The following chapters show the submenus in the system monitor.
Those menu items which do not appear in these chapters result in parameter display on direct selection. Subsequent to this, two examples of the parameter display are shown and further operation of the two monitor modes is explained.

System selection

In the "system selection" menu, the following items are presented for selection:

Fluoroscopy

The following items can be selected:

Radiography

With "release/status", a further submenu is available with the items "release with HW synchronization" and "release without HW synchronization".

Image intensifier system

The "central TV unit" menu item is subdivided into "DR mode" and "normal mode" as additional submenu.

Digital radiography

The following processes are found in the "digital radiography" menu:

Options

The "options" menu includes partly processes which are not yet implemented in the current systems. When selecting such a process, no difference is made to the other processes except that here telegrams can never be received if taken from a trace file.

Parameter display online monitor

The following representation illustrates the parameters of the "radiography mode/DR parameter/data" process in the online mode.

The parameters are displayed in a window with dynamic column generation (max. of five columns). The first line of the window indicates the menu path through which parameter display can be achieved. The individual menu names (max. of 60 characters) are abbreviated according to the menu nesting depth. The second line serves for centric output of the column headings (max. of 30 or 15 characters).

The first column (max. of 30 characters) serves for indication of the parameter name and of any existing dimensions. Columns 2-4 are provided for display of the corresponding parameter value. The number of columns is determined by the process and the number of columns to be represented herewith.

The columns for value indication (max. of 15 characters) are blank at the start of the system monitor and are filled only by receiving the corresponding RAS functions. Parameters which do not exist in a column are marked with "---".

Operation, online monitor

If the number of parameters exceeds the maximum displayable number (13 lines), the parameters can be scrolled using the cursor keys. This is indicated with corresponding icons.

Using the "F6 restart" function key, the parameter display can be deleted at any time. This may become necessary at the end of a process to allow better viewing of the incoming values through the deleted parameters at the beginning of a new process.

An online monitor session can be stopped at any time with ESCAPE. In this case, the parameter window and the trace file are closed.
This corresponds to reinitialization of the RAS network by the SPC and is indicated in a window.

Parameter display, offline monitor

The following representation illustrates the parameters of the "radiography/Dr parameter/ data" menu in the offline mode. The parameter representation corresponds to that of the online mode. Moreover, the telegram number and the time of the last decoded RAAS function are displayed.

Operation, offline monitor

Operation of the offline monitor corresponds to that of the online monitor except for the control of the read operation in the trace file. This is effected by the two page keys. PAGE DOWN allows to scroll forward and PAGE UP to scroll backward in the file. For PAGE UP it should be noted that this means reading the file from the start to the preceeding function. In the case of large trace files, this may result in parameter display delays. Reading is visualized by incrementing the telegram number in the parameter display.

Information texts

In the parameter display, the F9 function key is occupied by the text "info".
This serves for generation of a window for the output of info texts supplying the service technician with information on the indicated parameters and pointers regarding error correction.

In the online monitor mode, the info window is not displayable since this would interfere with telegram reception.

This part of the service software allows to record the telegram traffic in the network onto a file. Subsequently, the recording can be displayed symbolically. In this manner, dynamic network errors can be traced. A telegram is decoded according to name, transmitter, receiver, time and supplement.

The telegram trace is a viewing tool and is therefore unable to perform any active interventions in the network.

On selecting the trace in the main menu, a window appears. This serves for input of a file name (max. of eight characters). In the bottom part of the window, up to 20 names of already existing recordings are indicated (operation analogously to "program start"); only the trace files belonging to the currently loaded unit are displayed. After the names have been entered, existence of the file and its belonging to the current unit are checked by the program. An existent file is analyzed for later display. A new file is opened for recording. The state of the specific situation is announced by messages in each case.

If analysis or opening of the indicated file was successful, a trace menu is displayed with the following functions:

- Recording Recording of the network communication

Recording

Selection of the "Recording" menu item in the trace is followed by a sequential menu with the two types of recording "online trace" and "history trace".

In the "online" mode, telegrams are recorded from the successful coupling in the RAS network onward.

In the "history" mode, the service program records telegrams that were stored in the queue of RAS controller and terminates the "history" mode after receipt of all telegrams.

Start of recording

After the mode of recording has been selected, the existence of the indicated file is checked by the program. To avoid unintentional deletion of an existing recording, a checking inquiry is made and, if necessary, entry of another name is made possible.

The name is provided with the extension "TRC", the file is opened and the name of the current configuration (unit) is entered at the beginning of the file, so that the communication stored in this file can only be loaded in connection with the correct system.

Subsequently, the SPC is coupled to the network. The type of recording determines whether the queue of the RAS controller is erased (online trace) or passed on to the SPC (history trace). The state of coupling is accompanied by messages in a separate window. Failure of the communication set-up is signalled by corresponding error messages.

As soon as communication with the RAS is set up, the service program outputs the number of telegrams received.
This is a visual feedback via the telegram throughput for the service technician who can recognize in this manner any interruption of the current communication by the counter not incrementing any more.

Time of recording

A criterion of the duration of a recording is the available storage capacity of the SPC hard disk. An additional criterion are the telegrams received in the RAS network. As soon as the capacity limit of the disk is reached, recording is discontinued with the corresponding message.

End of recording

Recording can be terminated at any time by operating the ESC-key.

In case of the "history trace", recording is terminated after read-out of the RAS-S queue.

Load recording

In the "system monitor" menu a trace file belonging to the selected unit can be leaded with "load".

To do so, no system is required, so that the results of recording can also be analyzed afterwards.

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